

Amendment and Response

Applicant: Mark A. Smith et al.

Serial No.: 09/839,385

Filed: April 20, 2001

Docket No.: 10001074-1

Title: INK CONTAINER CONFIGURED TO ESTABLISH RELIABLE FLUIDIC CONNECTION TO A RECEIVING STATION

REMARKS

This Amendment is responsive to the Office Action mailed October 31, 2002, in which Claims 1-8 and 10-20 were rejected, and claims 1, 10 and 16 were objected to. With this Response, claims 1 and 10 have been amended. Claims 1-8 and 10-20 remain pending in the application and are presented for reconsideration and allowance.

Claim Objections

The Examiner objected to claims 1, 10, and 16 because "the markings showing changes made to the claims should be removed."

In the Preliminary Amendment filed October 1, 2002, Applicant's attorney inadvertently failed to submit claims without markings, and instead only submitted claims with markings showing the changes made to the claims. Applicant's attorney apologizes for this error. The present Amendment and Response shows all claims without markings, in addition to a set of claims with markings showing changes made to the claims. Accordingly, withdrawal of the objection to claims 1, 10 and 16 is respectfully requested.

Claim Rejections under 35 U.S.C. § 103

The Examiner rejected claims 1-8 and 10-20 under 35 U.S.C. § 103(a) as being unpatentable over Tomikawa et al. U.S. Patent No. 6,039,441 in view of Aono et al. U.S. Patent No. 6,471,321.

Tomikawa et al. is said to disclose the claimed features of the invention including a replaceable ink container (1, Fig. 1a) for providing ink to an inkjet printing system (Fig. 5b), and a method for forming a seal (Fig. 1b). The inkjet printing system is said to include a replaceable printhead 21 and a receiving station 27 for receiving the replaceable ink container. The receiving station is said to have a fluid inlet 24 and a sealing structure 22. The replaceable ink container is said to comprise a reservoir 2 defining a fluid outlet 11 and a sealing surface 10 proximate the fluid outlet (Fig. 1b). A sealing material (ink) is said to be contained to within the reservoir 2 for wetting the sealing surface (Figs. 1a, 1b), the sealing material between the sealing surface and the sealing structure acting to seal defects between

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the sealing surface and the sealing structure. (The Examiner points out the "ink meniscus on bottom surface of 10 is between 10 and 22, Fig 1b"). The reservoir is said to contain a quantity of ink (Fig. 1a), and the sealing surface is said to be configured to be sufficiently wettable such that the sealing surface is wet by the sealing material (wet by ink, column 5, lines 59-60 of Tomikawa et al). The storage reservoir is said to have a capillary storage material 3 disposed therein for retaining ink.

However, Tomikawa et al. is said not to disclose: a sealing material including solid particles held in suspension; the solid particles are pigment particles, the solid particles are carbon black particles; and the suspension is a dispersant. Nevertheless, Aono et al. is said to disclose an ink containing black pigments (column 10, line 7) and a dispersant (column 10, line 8) for the purpose of forming ink meniscus (column 10, line 10). Therefore, the Examiner has taken the position that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Tomikawa et al. with a pigment-based ink as disclosed by Aono et al. for the purpose of forming ink meniscus.

In response, claim 1 has been amended and is now directed to a replaceable ink container for providing ink to an inkjet printing system having a receiving station for receiving the replaceable ink container. The receiving station has a fluid inlet and a sealing structure. The replaceable ink container comprises a fluid reservoir defining a fluid outlet and **a sealing surface for engaging the sealing structure** proximate the fluid outlet, and a sealing material contained within the reservoir for wetting the sealing surface. The sealing material includes solid particles held in suspension. Solidification of the solid particles **between the sealing surface and the sealing structure** acts to seal defects between the sealing surface and the sealing structure.

Using a sealing material that contains solid particles that come out of a suspension and solidify between the engaged sealing surface and the sealing structure creates an improved seal between the sealing surface of the replaceable ink container and the sealing structure of the receiving station. This improved seal seals defects in the engaged sealing surface and/or the sealing structure. The improved seal thereby prevents the loss of volatiles from ink within the container and minimizes the transfer of air into the ink delivery system resulting in improved printing system reliability and an improvement in the quality of printed

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images. A replaceable ink container having a sealing material including solid particles held in a suspension, where solidification of the solid particles between the engaged sealing surface and the sealing structure acts to seal defects between the sealing surface and the sealing structure is simply not taught, disclosed or anticipated by the combination of Tomikawa et al. and Aono et al.

Tomikawa et al. in Figures 1a, 1b, 2a and 2b is directed to a replaceable ink tank 1 insertable into a holding member 27 of a printing system. The holding member 27 includes a recording head 21 and an elastic jointing member 22. The ink tank 1 includes an ink chamber 2 having a joint port 11 which is connectible to the elastic jointing member 22 to deliver ink from the ink chamber 2 to the recording head 21. The elastic jointing member 22 includes an umbrella shaped portion that engages a depressed part 14 of the ink tank 1 to form a hermetic seal therebetween.

Tomikawa et al. does not teach or disclose what is claimed in amended independent claim 1. In particular, Tomikawa et al. does not teach or disclose the reservoir defining a fluid outlet and **a sealing surface configured for engaging the sealing structure** proximate the fluid outlet, and the sealing material contained within the reservoir includes solid particles held in suspension, where **solidification of the particles between the sealing surface and the sealing structure** acts to seal defects between the sealing surface and the sealing structure.

Clearly Tomikawa et al. does not show, teach or suggest, either implicitly or explicitly, that the replaceable ink container comprises a fluid reservoir defining a fluid outlet and a sealing surface configured for engaging the sealing structure proximate the fluid outlet. As characterized by the Examiner, meniscus forming member 10 (the sealing surface) is not configured for engagement and does not engage elastic jointing member 22 (the sealing structure). Further, solidification of sealing material (ink) on meniscus forming member 10 would result in the blockage of ink flow from the reservoir 2, rendering the ink container useless.

Aono et al. does not remedy the deficiency of the primary reference Tomikawa et al., since Aono et al. is merely directed to an ink jet recording head capable of realizing substantially constant discharge characteristics for inks of different types (such as dye inks

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Docket No.: 10001074-1

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and particle inks). Hence, like Tomikawa et al., there is no support whatsoever in Aono et al. for a sealing surface of the ink container configured for engaging a sealing structure of a receiving station. Further, there is no support for a sealing material within an ink container wetting the area between the sealing surface of the ink container and the sealing structure of the receiving station, and solidifying between the sealing surface and the sealing structure.

For the reasons set forth above, Applicants believe the combination of Tomikawa et al. and Aono et al. does not disclose, teach, suggest or make obvious, either implicitly or explicitly, what is claimed by Applicants in amended independent claim 1. Applicants therefore believe that the rejection of independent claim 1 under 35 U.S.C. § 103(a) has been overcome and should be withdrawn. Such action is respectfully requested.

Independent claim 10 has been amended to include language similar to that referred to above in connection with independent claim 1. In addition, independent claim 16 already includes language similar to that referred to above in connection with independent claim 1. Thus, the remarks above directed to independent claim 1 are equally applicable to independent claims 10 and 16. Therefore, for the reasons set forth above, Applicants believe that the combination of Tomikawa et al. and Aono et al. does not disclose, teach, suggest or make obvious, either explicitly or implicitly, what is claimed by Applicants in independent claims 10 and 16. For the reasons provided, Applicants believe that the rejection of independent claims 10 and 16 under 35 U.S.C. § 103(a) have been overcome and should be withdrawn. Such action is respectfully requested.

Independent claim 7 has not been amended, but does include language similar to that referred to above in connection with independent claim 1. Specifically, independent claim 7 claims a method for forming a seal between a replaceable ink container and a sealing structure, the method comprising wetting a sealing surface on the replaceable ink container with a sealing material defined by solid particles held in a suspension which is contained within the replaceable ink container, and **engaging the sealing surface with a sealing structure, whereby the sealing material is disposed therebetween, and solidifying the sealing material** so that the solid particles fall out of the suspension and seal defects between the sealing surface and the sealing structure. The remarks above directed to independent claim 1 are therefore equally applicable to independent claim 7. Therefore, for the reasons

Amendment and Response

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set forth above, Applicants believe that the combination of Tomikawa et al. and Aono et al. does not disclose, teach, suggest or make obvious, either implicitly or explicitly, what is claimed by Applicants in independent claim 7. Hence Applicants believe that the rejection of independent claim 7 under 35 U.S.C. § 103(a) has been overcome and should be withdrawn. Such action is respectfully requested.

Dependent claims 2-6, 8, 11-15 and 17-20 are directly or indirectly dependent upon independent claims 1, 7, 10, and 16. As discussed above, it is believed that independent claims 1, 7, 10, and 16 are now in condition for allowance. Therefore, consideration and allowance of dependent claims 2-6, 8, 11-15 and 17-20 is also requested.

In light of the above, Applicant believes independent claims 1, 7, 10 and 16, and the claims depending therefrom, are in condition for allowance. Allowance of these claims is respectfully requested.

CONCLUSION

Attached hereto is a marked-up version of the changes made to the specification and/or the claims by the current Amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Amendment and Response

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Serial No.: 09/839,385

Filed: April 20, 2001

Docket No.: 10001074-1

Title: INK CONTAINER CONFIGURED TO ESTABLISH RELIABLE FLUIDIC CONNECTION TO A RECEIVING STATION

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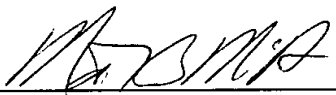
Respectfully submitted,

Mark A. Smith et al.,

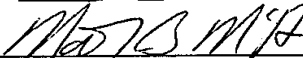
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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Commissioner for Patents, Washington, D.C., 20231 on this 22nd day of January, 2003.

By 
Name: Matthew B. McNutt



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Mark A. Smith et al. Examiner: Michael P. Nghiem
Serial No.: 09/839,385 **VERSION WITH MARKINGS
TO SHOW CHANGES MADE** Group Art Unit: 2861
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AMENDMENT AND RESPONSE

Commissioner for Patents
Washington, D.C. 20231

Dear Sir/Madam:

This Amendment is responsive to the Office Action mailed October 31, 2002. Please amend the above-identified patent application as follows:

IN THE CLAIMS

Please amend claims 1 and 10 as follows:

1. (Thrice Amended) A replaceable ink container for providing ink to an inkjet printing system, the inkjet printing system having a receiving station for receiving the replaceable ink container, the receiving station having a fluid inlet and a sealing structure, the replaceable ink container comprising:

a reservoir defining a fluid outlet and a sealing surface configured for engaging the sealing structure proximate the fluid outlet; and

a sealing material contained within the reservoir for wetting the sealing surface, the sealing material including solid particles held in a suspension, solidification of the solid particles between the sealing surface and the sealing structure acting to seal defects between the sealing surface and the sealing structure.

2. The replaceable ink container of claim 1 wherein the solid particles are pigment particles.

3. The replaceable ink container of claim 1 wherein the solid particles are carbon black particles.

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4. The replaceable ink container of claim 1 wherein the suspension is a dispersant.
5. The replaceable ink container of claim 1 wherein the sealing material contained within the reservoir is a quantity of ink.
6. The replaceable ink container of claim 1 wherein the sealing surface is configured to be sufficiently wettable such that the sealing surface is wet by the sealing material.
7. A method for forming a seal between a replaceable ink container and a sealing structure, the method comprising:
 - wetting a sealing surface on the replaceable ink container with a sealing material defined by solid particles held in a suspension which is contained within the replaceable ink container;
 - engaging the sealing surface with a sealing structure whereby the sealing material is disposed there between; and
 - solidifying the sealing material so that the solid particles fall out of the suspension and seal defects between the sealing surface and the sealing structure.
8. The method of claim 7 wherein the sealing material is an ink contained within the replaceable ink container.
9. (Cancelled)
10. (Thrice Amended) A replaceable ink container for providing ink to an inkjet printing system, the inkjet printing system having a receiving station for receiving the replaceable ink container, the receiving station having a fluid inlet and a sealing structure, the replaceable ink container comprising:

Amendment and Response

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a storage reservoir having a capillary storage material disposed therein for retaining ink, the storage reservoir defining a fluid outlet and a sealing surface configured for engaging the sealing structure proximate the fluid outlet; and

an ink retained within the capillary storage material, the ink having particles suspended therein, the particles solidifying between the sealing surface and the sealing structure to seal defects between the sealing surface and the sealing structure.

11. The replaceable ink container of claim 10 wherein the particles are pigment particles.

12. The replaceable ink container of claim 10 wherein the particles are carbon black particles.

13. The replaceable ink container of claim 10 wherein the ink further includes a dispersant.

14. The replaceable ink container of claim 10 wherein the sealing surface proximate the fluid outlet is configured to be wetted by the ink stored within the ink container.

15. The replaceable ink container of claim 10 wherein the sealing surface is configured for enhanced wettability such that the sealing surface is wet by the ink.

16. A replaceable printing component for an inkjet printing system configured for receiving the replaceable printing component, the inkjet printing system having a fluid inlet and a sealing structure, the replaceable printing component comprising:

a sealing surface configured for engaging a corresponding sealing structure on the inkjet printing system; and

wherein the sealing surface is configured so that sealing material, defined by solid particles held in a suspension, wets the sealing surface so that solidification of the solid particles between the sealing surface and the corresponding sealing structure seals defects between the sealing surface and the corresponding sealing structure.

Amendment and Response

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Docket No.: 10001074-1

Title: INK CONTAINER CONFIGURED TO ESTABLISH RELIABLE FLUIDIC CONNECTION TO A RECEIVING STATION

17. The replaceable printing component of claim 16 wherein the replaceable printing component is a replaceable ink container.
18. The replaceable printing component of claim 16 wherein the replaceable printing component is a replaceable printhead.
19. The replaceable printing component of claim 16 wherein sealing material is pigmented ink.
20. The replaceable printing component of claim 16 wherein the sealing surface engages the corresponding sealing structure on the inkjet printing system to form a face seal.